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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/629,498	07/29/2003	Anthony J. Lochtefeld	ASC-061	6735
51414	7590	06/02/2006	EXAMINER SMITH, BRADLEY	
GOODWIN PROCTER LLP PATENT ADMINISTRATOR EXCHANGE PLACE BOSTON, MA 02109-2881			ART UNIT 2891	PAPER NUMBER

DATE MAILED: 06/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

12 5/

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/629,498	LOCHTEFELD ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Bradley K. Smith	2891	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-83 is/are pending in the application.
- 4a) Of the above claim(s) 1-54 and 66-83 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 55-65 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>7/25/03, 11/5/03, 4/23/04</u>   | 6) <input checked="" type="checkbox"/> Other: <u>search notes</u>           |

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election without traverse of species 1 in the reply filed on 2/27/06 is acknowledged.

### ***Claim Objections***

Claims 55-65 are objected to because of the following informalities: the claims disclose selecting a thickness of the regrowth layer. The examiner suggests using the word growing since "selecting" can be subjective. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 55, 56, 62 and 65 are rejected under 35 U.S.C. 102(e) as being anticipated by Fitzgerald (US 2003/0089901). Fitzgerald discloses forming a first layer portion over a substrate, the first layer having a first equilibrium lattice constant; forming a regrowth layer over the first layer portion (602), the regrowth layer having a regrowth equilibrium lattice constant different from the first equilibrium lattice constant (604),

wherein a plurality of misfit dislocations form at an interface between the first layer portion and the regrowth layer (inherent); forming a second layer over the regrowth layer (608); and selecting a thickness of the regrowth layer to define a distance between a top surface of the second layer and the misfit dislocations corresponding to the selected placement of the misfit dislocations(see 0028 –0036 and 6A-6D). With regards to claim 56, Fitzgerald discloses the second material is strained (see figure 6A-6D). With regards to claims 62 and 65, Fitzgerald discloses the regrowth layer difference between the first and second layer is less than about 1%-2% (see 0029).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 58, 61, and 64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fitzgerald. Fitzgerald discloses forming a first layer portion over a substrate, the first layer having a first equilibrium lattice constant; forming a regrowth layer over the first layer portion (602), the regrowth layer having a regrowth equilibrium lattice constant different from the first equilibrium lattice constant (604), wherein a plurality of misfit dislocations form at an interface between the first layer portion and the regrowth layer (inherent); forming a second layer over the regrowth layer (608); and selecting a thickness of the regrowth layer to define a distance between a top surface of

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the second layer and the misfit dislocations corresponding to the selected placement of the misfit dislocations(see 0028 –0036 and 6A-6D). Furthermore Fitzgerald discloses forming a regrowth layer that is 500nm or less but does not specifically disclose forming a layer that is 450 nm, 210 nm or 130 nm. But the examiner contends that to claim a specific thickness would be obvious to one of ordinary skill in the art because the thickness is a result effective variable. “[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable range by routine experimentation.” In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Therefore it would have been obvious to one of ordinary skill in the art to change the thickness of the regrowth layer, because it could change the placement of the misfit dislocations.

Claims 59 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fitzgerald. Fitzgerald discloses forming a first layer portion over a substrate, the first layer having a first equilibrium lattice constant; forming a regrowth layer over the first layer portion (602), the regrowth layer having a regrowth equilibrium lattice constant different from the first equilibrium lattice constant (604), wherein a plurality of misfit dislocations form at an interface between the first layer portion and the regrowth layer (inherent); forming a second layer over the regrowth layer (608); and selecting a thickness of the regrowth layer to define a distance between a top surface of the second layer and the misfit dislocations corresponding to the selected placement of the misfit dislocations(see 0028 –0036 and 6A-6D). Furthermore Fitzgerald discloses forming a regrowth layer that is 1% germanium difference but does not specifically disclose

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forming a layer that is has a germanium difference less than 1%. But the examiner contends that to claim a specific thickness would be obvious to one of ordinary skill in the art because the germanium thickness is a result effective variable. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable range by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Therefore it would have been obvious to one of ordinary skill in the art to change the germanium of the regrowth layer, because it could change the placement and the amount of the misfit dislocations.

Claims 57, 60, and 63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fitzgerald. Fitzgerald discloses forming a first layer portion over a substrate, the first layer having a first equilibrium lattice constant; forming a regrowth layer over the first layer portion (602), the regrowth layer having a regrowth equilibrium lattice constant different from the first equilibrium lattice constant (604), wherein a plurality of misfit dislocations form at an interface between the first layer portion and the regrowth layer (inherent); forming a second layer over the regrowth layer (608); and selecting a thickness of the regrowth layer to define a distance between a top surface of the second layer and the misfit dislocations corresponding to the selected placement of the misfit dislocations(see 0028 –0036 and 6A-6D). Furthermore Fitzgerald discloses forming a regrowth layer that is a different composition but does not specifically disclose forming a layer that has a mismatch of lattice constant between .04% and .12% . But the examiner contends that to claim a mismatch of the lattice constants would be obvious to one of ordinary skill in the art because mismatch in lattice constants is a

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result effective variable. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable range by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Therefore it would have been obvious to one of ordinary skill in the art to change the mismatch of lattice constants between the first and the regrowth layer, because it could directly affect the amount of dislocations and the placement of the dislocations.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bradley K. Smith whose telephone number is 571-272-1884. The examiner can normally be reached on 10-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Baumeister can be reached on 571-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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A handwritten signature in black ink, appearing to read 'B. K. Smith', written in a cursive style.

Bradley K Smith  
Primary Examiner  
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